AP Statistics Reading Notes
Pg. 145—153

1. The Correlation Coefficient (*r*) describes the direction and strength of a linear relationship between two quantitative variables.

2. Before we can compute a correlation, we must first meet the three conditions below:

   a. Quantitative Data Condition
   b. Straight Enough Condition
   c. Outlier Condition

3. If I have a set of quantitative data, that has a linear relationship with no outliers and I compute an *r-value* of -.876, what can I conclude about the strength and direction of the relationship? Negative + strong

4. If I have a set of quantitative data, that has a linear relationship with no outliers and I compute an *r-value* of .043, what can I conclude about the strength and direction of the relationship? Positive + very weak. It is probably barely linear.

5. True or False. If I have a set of quantitative data and compute an *r*-value of -.015, then there is no (or very little) relationship between the two variables.
   There could be a strong non-linear relationship

6. What is wrong with this statement: "There is a strong positive correlation between weight and eye color." You CANNOT have a correlation between two qualitative (categorical) variables.

7. Correlation values are always between -1 and +1.

8. Suppose that I find the correlation between variables to be 0.768. If I switch my response and explanatory variables, and compute my correlation, it will have a value of
   0.768 - switching your response + explanatory variable does NOT change your r-value.

9. Suppose I calculated the correlation between height (inches) and weight (pounds) to be 0.675. Then suppose that I decided to change my measurement units to centimeters and kilograms and re-calculate the correlation. My new correlation would be 0.675
   Changing units or $\times, \div, +, -$ constants to your variable(s) does not change your r-value.

10. Sketch the scatterplots that are described below:

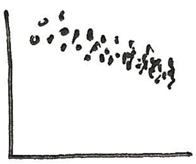
a. $r = -0.986$
b. $r = 0.564$
c. $r = 0.023$
d. $r = 0.023$ (make the scatterplot show a relationship, even though the *r*-value is so low)

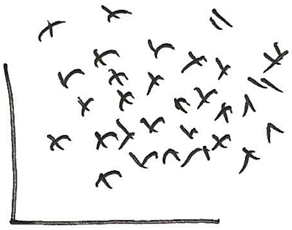
11. True or False. If the correlation between x and y is +1, then we can conclude that x causes y. NEVER CAUSATION

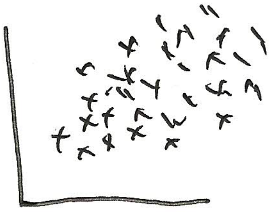
12. What is a lurking variable? What is the importance of a lurking variable?

a variable that affects the response variable, which is not the explanatory variable. It is the variable that makes it impossible to have a cause + effect relationship by looking at a scatterplot.

Ex. The correlation between child mortality rate + per capita cell phone ownership is .965. However, we cannot say that cell phone ~~ownership~~ ownership causes child mortality. There is a lurking variable present — INCOME — that really is the true variable affecting child mortality

10. a) 

c) 

b) 

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